***IN THE UNITED STATES PATENT AND TRADEMARK OFFICE***

Applicant: Caius Rommens *et al.*

Title: PRECISE BREEDING

Appl. No.: 10/607,538

Filing Date: 6/27/2003

Examiner: David T. Fox

Art Unit: 1638

**DECLARATION UNDER 37 C.F.R. § 1.132**

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

Sir:

1. I, Caius Rommens, have been employed as Director R&D at J. R. SIMPLOT COMPANY (Boise, Idaho), since 2000.

2. I have doctorate in Plant Biology from the Free University of Amsterdam. I have worked extensively in agricultural genetics throughout my professional career. Appended as Exhibit A is a copy of my Curriculum Vitae, evidencing this research.

3. I am the project director and co-inventor of the present application, USSN 10/607,538, which discloses and claims key SIMPLOT technologies. Our invention concerns the transformation of plants without using or necessarily incorporating bacterial or viral or non-plant DNA into the recipient plant's genome.

4. I also authored the peer-reviewed article Rommens *et al.*, "*Plant-derived transfer DNAs*," *Plant Physiol.* 139: 1338-49, 2005, which describes the presently claimed invention, and which was relied on by the Patent Office in the most recent Office Action dated May 9, 2008.

5. Our method and transformation constructs employ *Agrobacterium*-mediated transformation and associated vectors, but we have modified the transformation system so as to replace the traditional *Agrobacterium* T-DNA border sequences with nucleotide sequences that are native to plants. Specifically, we use what we call "P-DNA borders" which are nucleic acid sequences that are native to the plant genome and which comply with the consensus sequence denoted by SEQ ID NO: 93 in the application, ANGATNTATN$_6$GT.

6. We have found that in essentially all cases where we have used P-DNA border sequences that comport with SEQ ID NO: 93 in our transformation constructs,

we observe successful transformation of the relevant desired polynucleotide. Please see Exhibit B.

7. Exhibit B is a table which relates the successful transformation of twenty-seven different plants using P-DNA border sequences that comport with the ANGATNTATN$_6$GT consensus of SEQ ID NO: 93. Each of the P-DNA border sequences that resulted in successful transformation contained the conserved residues of the SEQ ID NO: 93 consensus, namely A-GAT-TAT------GT. I have highlighted the conserved residues in green.

8. All of the sequences in the Rommens *et al.*, "*Plant-derived transfer DNAs*," *Plant Physiol.* 139: 1338-49, 2005, which resulted in successful transformation events, *also* comported with the SEQ ID NO: 93 consensus. SEQ ID NOs: 41,42, 43, 44, 45, 46, 47, 48, 50, 52, 53, 54, and 55, as depicted in Table 2 of the application, all exactly comport with the SEQ ID NO: 93 consensus.

9. Thus, it is our contention that a P-DNA border sequence that comports with the consensus depicted in SEQ ID NO: 93 is a functional, plant-derived "border" sequence, and contributes to the transfer of the desired polynucleotide to which it is linked.

10. Hence, I assert that a successful transformation event is highly probable and predictable if a P-DNA border, which complies with the SEQ ID NO: 93 consensus sequence, is used in the transformation construct, as described in our application.

* * *

11. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

**Declarant**

Full name of declarant: Caius Rommens

**Declarant's signature** _____ Date 9/5/08

Country of Citizenship: Netherlands

Residence Address: 3395 East Windsong, Boise ID 83712

## EXHIBIT A

## DR. ROMMENS' CURRICULUM VITAE

**Research Experience:**

- Director Plant Sciences at J.R. Simplot Company, ongoing from September 2000.
  - Developed new methods for plant transformation and gene silencing (see, for instance, US Patent 7250554 and Patent Applications 2003/0221213A1, 2005/0034188A1, 2006/0156428A1, and 2008/0134356A1)
  - Developed new strategies for crop improvement
- Team Leader Disease Control at Monsanto Company, from March 1995 until August 2000
  - Developed strategies for enhanced disease resistance in agriculturally-important crops (see, for instance, US Patents 6544733, 6506962, 7030293, 7138273, 7148398, and 7294757)
  - Developed strategies for improved plant transformation (see, for instance, US Patent Application 2004/0133938A1).
- Postdoctoral Fellow at the University of California from January 1993 until February 1995.
  - Isolated various disease resistance genes (see US Patent 6245510 and 5859351)
- PhD Student at the Free University Amsterdam from Apr 1988 until December 1992.
  - PhD thesis of December 14th, 1992, entitled "Transposition of the maize Activator element in tomato"

**Partial List of Publications:**

**Rommens CM**, Richael CM, Yan H, Navarre DA, Ye J, Krucker M, Swords K (2008) Engineered native pathways for high kaempferol and caffeoylquinate production in potato. Plant Biotechnol J. 2008 Jul 23. [Epub ahead of print]

**Rommens CM**, Yan H, Swords K, Richael C, Ye J (2008) Low-acrylamide French fries and potato chips. Plant Biotechnol J. 2008 Jul 23. [Epub ahead of print]

**Rommens CM (2008)** The need for professional guidelines in plant breeding. Trends Plant Sci 13: 261-3.

Richael CM, Kalyaeva M, Chretien RC, Yan H, Adimulam S, Stivison A, Weeks JT, **Rommens CM (2008)** Cytokinin vectors mediate marker-free and backbone-free plant transformation. Transgenic Res. 2008 Mar 5. [Epub ahead of print]

Weeks JT, Ye J, **Rommens CM** (2008) Development of an in planta method for transformation of alfalfa (Medicago sativa). Transgenic Res 17: 587-597.

**Rommens CM**, Haring MA, Swords K, Davies HV, Belknap WR (2007) The intragenic approach as a new extension to traditional plant breeding. Trends Plant Sci 12: 397-403.

**Rommens CM** (2007) Intragenic crop improvement: combining the benefits of traditional breeding and genetic engineering. J Agric Food Chem 55: 4281-4288.

**Rommens CM**, Ye J, Richael C, Swords K (2006) Improving potato storage and processing characteristics through all-native DNA transformation. J Agric Food Chem 54: 9882-9887.

Yan H, **Rommens CM** (2007) Transposition-based plant transformation. Plant Physiol 143: 570-578.

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Yan H, Chretien R, Ye J, **Rommens CM** (2006) New Construct Approaches for Efficient Gene Silencing in Plants. Plant Physiol Jun 9; 141: 1508-1518.

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**Rommens CM**, Humara JM, Ye J, Yan H, Richael C, Zhang L, Perry R, Swords K (2004) Crop improvement through modification of the plant's own genome. Plant Physiol 135: 421-31.

**Rommens CM**, Kishore GM (2000) Exploiting the full potential of disease-resistance genes for agricultural use. Curr Opin Biotechnol 11: 120-125.

Gao AG, Hakimi SM, Mittanck CA, Wu Y, Woerner BM, Stark DM, Shah DM, Liang J, **Rommens CM** (2000) Fungal pathogen protection in potato by expression of a plant defensin peptide. Nat Biotechnol 18: 1307-1310.

Abad MS, Hakimi SM, Kaniewski WK, **Rommens CM**, Shulaev V, Lam E, Shah DM (1997) Characterization of acquired resistance in lesion-mimic transgenic potato expressing bacterio-opsin, Mol Plant Microbe Interact 10: 635-645.

Salmeron JM, Oldroyd GE, **Rommens CM**, Scofield SR, Kim HS, Lavelle DT, Dahlbeck D, Staskawicz BJ (1996) Tomato Prf is a member of the leucine-rich repeat class of plant disease resistance genes and lies embedded within the Pto kinase gene cluster. Cell 86: 123-133.

**Rommens CM**, Salmeron JM, Oldroyd GE, Staskawicz BJ (1995) Intergeneric transfer and functional expression of the tomato disease resistance gene Pto. Plant Cell 7: 1537-1544.

**Rommens CM**, Salmeron JM, Baulcombe DC, Staskawicz BJ (1995) Use of a gene expression system based on potato virus X to rapidly identify and characterize a tomato Pto homolog that controls fenthion sensitivity. Plant Cell 7: 249-57.

**Rommens CM**, van Haaren MJ, Nijkamp HJ, Hille J (1993) Differential repair of excision gaps generated by transposable elements of the 'Ac family'. Bioessays 15: 507-12.

**Rommens CM**, Munyikwa TR, Overduin B, Nijkamp HJ, Hille J (1993) Transposition pattern of a modified Ds element in tomato. Plant Mol Biol 21 1109-1119.

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**Rommens CM**, van Haaren MJ, Buchel AS, Mol JN, van Tunen AJ, Nijkamp HJ, Hille J (1992) Transactivation of Ds by Ac-transposase gene fusions in tobacco. Mol Gen Genet 231: 433-441.

**Rommens CM**, van der Biezen EA, Ouwerkerk PB, Nijkamp HJ, Hille J (1991) Ac-induced disruption of the double Ds structure in tomato. Mol Gen Genet 228: 453-458.

Haring MA, **Rommens CM**, Nijkamp HJ, Hille J (1991) The use of transgenic plants to understand transposition mechanisms and to develop transposon tagging strategies. Plant Mol Biol 16: 449-461. Review.

Haring MA, Gao J, Volbeda T, **Rommens CM**, Nijkamp HJ, Hille J (1989) A comparative study of Tam3 and Ac transposition in transgenic tobacco and petunia plants. Plant Mol Biol 13: 189-201.

## EXHIBIT B

| Name | Sequence | Functional | Reference |
|---|---|---|---|
| SEQID93 | ----[illegible]---- | | |
| SEQID 54 | TGAC[illegible]AAAC | Yes | USSN 10/607,538 |
| SEQID 55 | TGGC[illegible]AAAC | Yes | USSN 10/607,538 |
| Le01(551) | GGCC[illegible]AATG | Yes | Rommens, 2005** |
| St02(551B) | GGCC[illegible]AATG | Yes | Rommens et al., 2005 |
| Ca01(551C) | GGCC[illegible]AATG | Yes | Rommens et al., 2005 |
| NM114337 | TGAC[illegible]CAAC | Yes | USSN 10/607,538 |
| St03*(605) | ATGC[illegible]AAAC | Yes | Rommens et al., 2005 |
| St04(737) | AGGC[illegible]AGGT | Yes | Rommens et al., 2005 |
| Le02(719) | CCGC[illegible]AGAG | Yes | Rommens et al., 2005 |
| Le03*(560) | CCGC[illegible]ATGC | Yes | Rommens et al., 2005 |
| Le04(724) | TCAC[illegible]TTCC | Yes | Rommens et al., 2005 |
| Le05(609) | GGGC[illegible]AGGT | Yes | Rommens et al., 2005 |
| Ms01*(820) | CGGC[illegible]ATAC | Yes | Rommens et al., 2005 |
| SEQID 283 | CGGC[illegible]AAAT | Yes | US20070250948A1 |
| Hv01(570) | GGGC[illegible]ATAT | Yes | Rommens et al., 2005 |
| Os01(923) | AGCC[illegible]AAGT | Yes | Rommens et al., 2005 |
| Os02(924) | ATGC[illegible]AGTG | Yes | Rommens et al., 2005 |
| Os03(925) | ACAC[illegible]TACAT | Yes | Rommens et al., 2005 |
| Apple | CGGC[illegible]ATAC | Yes | New from Simplot |
| Brassica | AGCC[illegible]AAAC | Yes | New from Simplot |
| pSIM635 | GGGC[illegible]AGGT | Yes | New from Simplot |
| Zm01(927) | CCAC[illegible]ACGC | Yes | Rommens et al., 2005 |
| Ta01(928) | GGAC[illegible]ATAT | Yes | Rommens et al., 2005 |
| SEQID 236 | TGAC[illegible]ATTT | Yes | US20070250948A1 |
| SEQID 237 | GGAC[illegible]ATTT | Yes | US20070250948A1 |
| SEQID 238 | ATGC[illegible]AAAT | Yes | US20070250948A1 |
| SEQID 239 | ATAC[illegible]AAAT | Yes | US20070250948A1 |
| Petunia | GGAC[illegible]AAAC | Yes | Conner et al., 2007* |
| Petunia | TGGC[illegible]ATG | Yes | Conner et al., 2007* |
| Mt01(568) | CGGC[illegible]ATAC | Yes | Rommens et al., 2005 |
| Le06(603) | GGGC[illegible]AAAC | Yes | Rommens et al., 2005 |
| Le07(549) | GTAC[illegible]AAGA | Yes | Rommens et al., 2005 |
| Le08(722) | TTAC[illegible]AACG | Yes | Rommens et al., 2005 |
| Le09(721) | TTAC[illegible]ATTC | Yes | Rommens et al., 2005 |
| Le10(608) | TGGC[illegible]ACAA | Yes | Rommens et al., 2005 |
| Le11(727) | AAGC[illegible]TACC | Yes | Rommens et al., 2005 |
| pSIM566 | GGAC[illegible]AAAC | Yes | New from Simplot |
| pSIM636 | TGGC[illegible]ACAA | Yes | New from Simplot |
| pSIM734 | CGCC[illegible]AGAA | Yes | New from Simplot |

*: Conner AJ, Barrell PJ, Baldwin SJ, Lokerse AS, Cooper PA, Erasmuson AK, Nap JP, Jacobs JME (2007) Intragenic vectors for gene transfer without foreign DNA. Euphytica 154, 341-353.

**Rommens et al., "Plant-derived transfer DNAs," Plant Physiol. 139: 1338-49, 2005